

LASER-BASED MEASUREMENTS OF COMBUSTION SPECIES DURING FIREFIGHTING ONBOARD MILITARY VEHICLES

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Recent efforts towards finding a replacement for ozone-depleting Halon fire extinguishing agents have necessitated the need for in-situ measurements of fuels, oxidizers, and combustion products during fire suppressant testing. Measurements of concentrations of these species are required to help determine the efficiency of fire suppression of candidate Halon replacements as well as to determine toxic gases produced during suppression. Figure 1 shows a measurement (extractive Fourier transform spectroscopy) of gases present during inhibition of a JP-8 fuel fire by Halon 1301 (CF_3Br) on board a Bradley Fighting Vehicle.

We report in-situ measurements of concentrations of CH_4 , O_2 , CO , H_2O , NO_2 , and HF gases on board military vehicles during fire suppression testing. Concentrations of these gases are determined using near-infrared tunable diode laser absorption spectroscopy. Results from these experiments are compared to results which use extractive sampling and Fourier transform spectroscopy for concentration measurements.

